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# Surface Sediment Recovery Depth Discussion with EPA

Portland Harbor Superfund Site  
Pre-Remedial Design AOC Baseline Investigation

May 2, 2018

# Agenda and Call-in Information

- Bottom conditions
  - Field observations
  - photos and field logs
- RI map comparison
- Protocol Discussion

Join meeting in my WebEx Personal

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Join by phone

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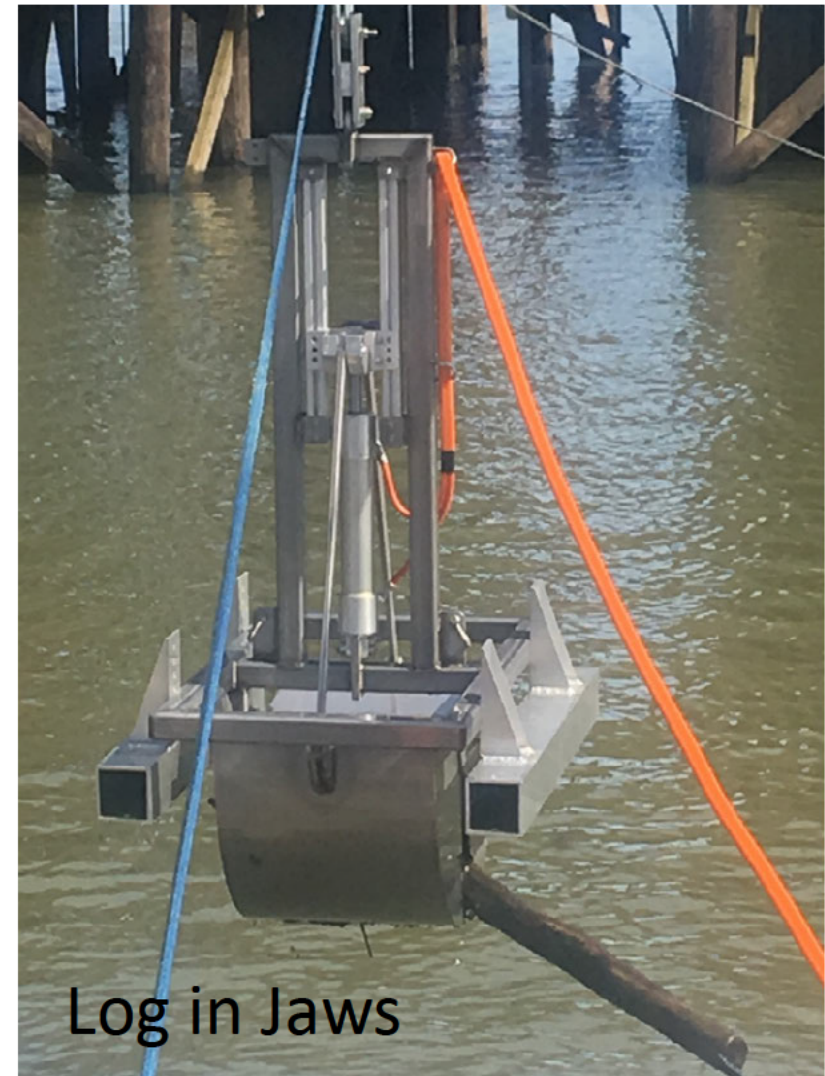
Access code:

[Global call-in numbers](#) | [Toll-free calling restrictions](#)

- Wood debris (stuck in jaws, or predominant matrix)
- Loose gravel rock and riprap (stuck in jaws)
- Overpenetration
- Steep slopes
- Bedrock
- Hard, dense bottom (sand/gravel)

# Power Grab

- Stainless steel construction, built for this project
- 34 cm penetration depth
- 1000 lbs closing force
- Stable frame
- Total weight is 490 lbs
  - Grab = 240 lbs
  - Ballast weight can be added = 250 lbs



# Rock in Jaws



SG-B319,  
Attempt #1

# Silt over Sand & Cobbles (Low Recovery)

- Encountered at, for example:
- SG-B016
- SG-B399
- SG-B391



# Wood Debris



# Sand (Low Recovery, Station B050)

*4 attempts at primary station with 0, 15, 16, and 16 cm recovery depth)*

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SG-B050

Sample collected on 4.4.18

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# Cobbles in Jaws



3 attempts at primary location, abandoned for now

- Next step, move to Alt 1

[illegible]

# Station B419: Rock in jaws



# Station B414: Wood Debris and Gravel

- Target location was under barge so went directly to 25 ft radius
- Primary station – three failed attempts, no sediment recovery, located on slope with debris
- Alt 1 – three attempts, all had some wood in the jaws, recovery was 17 cm, 10 cm, and 17 cm.
- Alt 2 – did not go to this location because located very close to primary station and on the slope

## Portland Harbor PDI Surface Sediment Sampling Log

Vessel (circle one): P/V Tieton Cayuse

Weather Conditions: cloudy, 50° part sunny

Tide (ft CRD)/Source:

Depth Sounding Method: AirMar Echo Sounder (Bow Mounted)

Coordinate Datum/Source: NAD 1983 Oregon State Plane North (Intl ft)

Proposed Coordinates: Easting: 7644916.7 Northing: 688373

Sample Area (circle one):

Analytical Suite (circle one):

Baseline/BL Act

Full ROD Table 17

Sample Date: 4/30/18

Location ID: B414

Page: 1 of 4

Sampling Personnel: Notes: A Fit

Subcontractor Personnel: Samplers: T. Palmeiri

Deckhand: Rene

Sampling Equipment: Powergrab, Stainless Steel Bowls & Spoons

General River Location: all weights added 490 lb

EPA Oversight During Sample Collection? No Yes

If Yes, name of person: Wardah Azhar COM

Attempt #	Radius (ft)	Time	Actual Coordinates		Water Depth (ft)	Recovery Depth (cm)	JC (Y/N)	OL H2O (Y/N)	Accepted (Y/N); Photo	Additional Comments; Sampled Interval (cm)	In 3-PT? (Y/N)
			Easting	Northing							
1	25	1118	7644895	688364	43.5'	0	Y	Y	N	water washing out	-
2	25	1124	7644936.6	688372.3	43.5'	0	Y	Y	N	Washed out	-
3	250	1135	7644871	688376	51.9'	0	Y	Y	N	Washed out	-

3 x Attempt #s: no sample at primary

Homogenized 3-Point Composite Sample Description: no sample at primary

Sample Information

Sample ID	Sample Time	Sample Type (Primary, Duplicate, MS/MSD, EPA Split)	# of Containers
		Primary	

Additional Comments

Primary location is very close to berthed barge and on steep slope more directly to 25' radius. Attempt 2 = lead line felt like woody debris, Attempt 3 = flatter bottom, but is not soft, felt sandy + debris.

# Station B414: Wood Debris and Gravel

- Hand-probed area with weighted tape – woody, slope, sandy
- Alt 1 samples composited into 3-point gravelly SAND sample and archive pending discussions with EPA
- Compliant with approved FSP and “2 bowl” method not triggered here

## Portland Harbor PDI Surface Sediment Sampling Log

Vessel (circle one): RV Tieton Cayuse  
 Weather Conditions: cloudy, 50°  
 Tide (ft CRD)/Source:  
 Depth Sounding Method: AirMar Echo Sounder (Bow Mounted)  
 Coordinate Datum/Source: NAD 1983 Oregon State Plane North (Intl ft)  
 Proposed Coordinates: Easting: 7644907.97  
 Alt 1 Northing: 688391.03

Sample Area (circle one):  
 Analytical Suite (circle one):

Baseline/BL  
 Full ROD Table 17

EPA Oversight During Sample Collection? No ☒ Yes

Sample Date: 4.30.18 Location ID: B414 Page: 3 of 4  
 Sampling Personnel: Notes: Alt 1  
 Sampler: See previous  
 Captain: Page  
 Subcontractor Personnel:  
 Deckhand:  
 Sampling Equipment: Powergrab, Stainless Steel Bowls & Spoons  
 General River Location: all weights add 490 lb near Rm 11.5 E

SMA/In-water Core  
 Four Focused COCs  
 Downtown/Upriver

If Yes, name of person: Wardah Azhar CDM

Attempt Summary											
Attempt #	Radius (ft)	Time	Adjusted Coordinates		Water Depth (ft)	Recovery Depth (cm)	JC (Y/N)	OL H2O (Y/N)	Accepted (Y/N); Photo	Additional Comments; Sampled Interval (cm)	In 3-PT? (Y/N)
			Easting	Northing							
1	25	1146	tipped over before jaws closed, picked up + re-try								
1	25	1147	7644889.9	6884018.9	44.2	17	M	Y	Y	Some wood in jaws 0-17cm	Y
2	30	1203	7644885	688410	50.9	17	M	Y	Y	Some wood in jaws 0-10cm	Y
3	50	1219	7644885	688419	48.7	17	M	Y	Y	winnowed 1 side other side good near 0-17cm	Y

3 x Attempt #: 1+2+3  
10-17 cm  
 Homogenized 3-Point Composite Sample Description  
 Color, Minor/Major Constituent %, Density:  
Wet, loose, silty, gravelly SAND w/ <sup>S&M</sup> rootlets, twigs, organics - 2.5Y 4/2 dark grayish brown (visual - has some clay to it)

Sample Information  
 Sample ID: PDI-SC-B414-BL1  
 Sample Time: 1235  
 Sample Type (Primary, Duplicate, MS/MSD, EPA Split): Primary  
 # of Containers: 7  
 Archive: Alt 1  
 Pending discussion w/ EPA

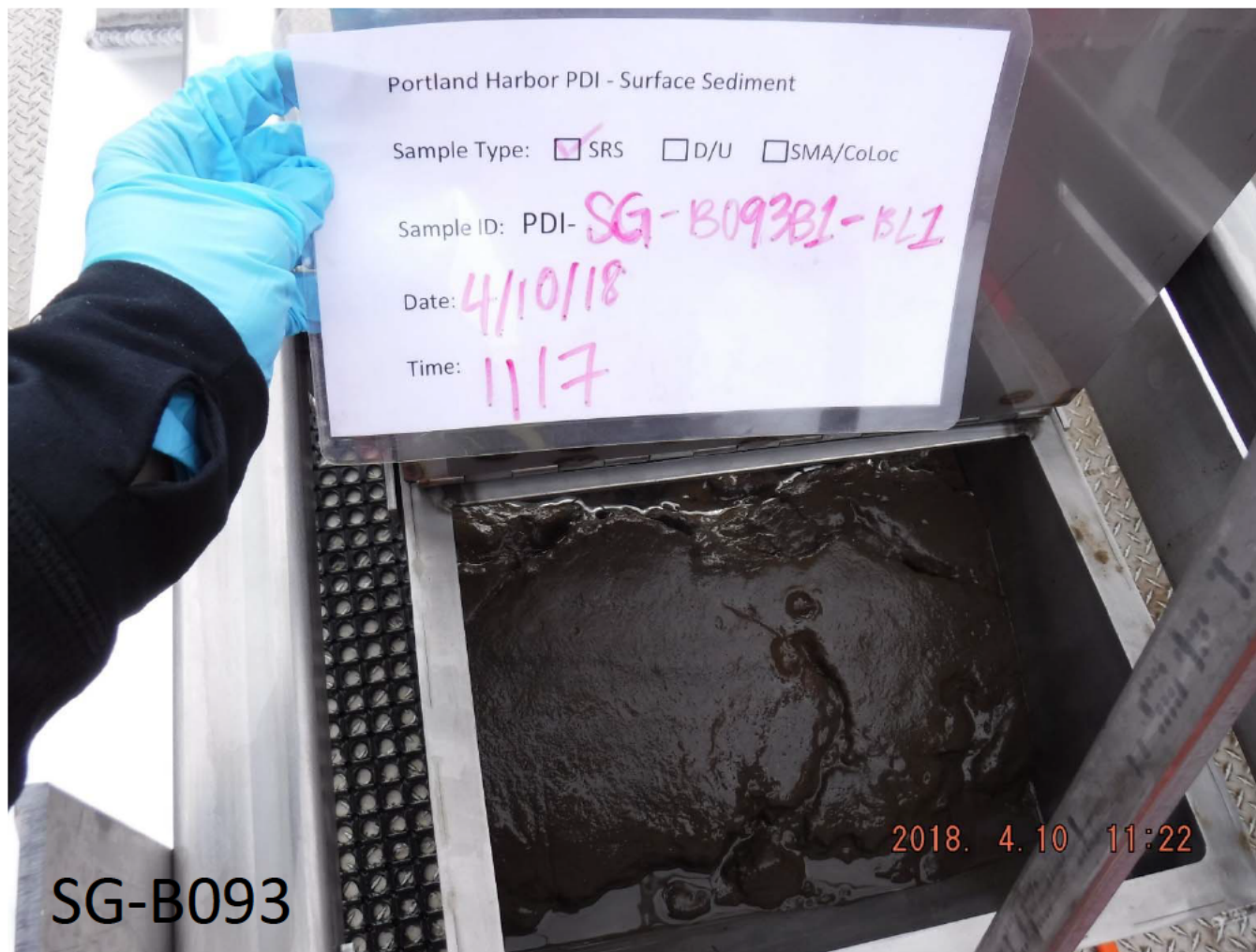
Additional Comments  
 max directly to 20' radius at Alt 1 because target location was very close to failed primary location, Attempt 2 50' radius, hunting for M= jaws mostly closed good areas, off the steep slope. No value going to Alt 2 because location is disturbed w/ near river.

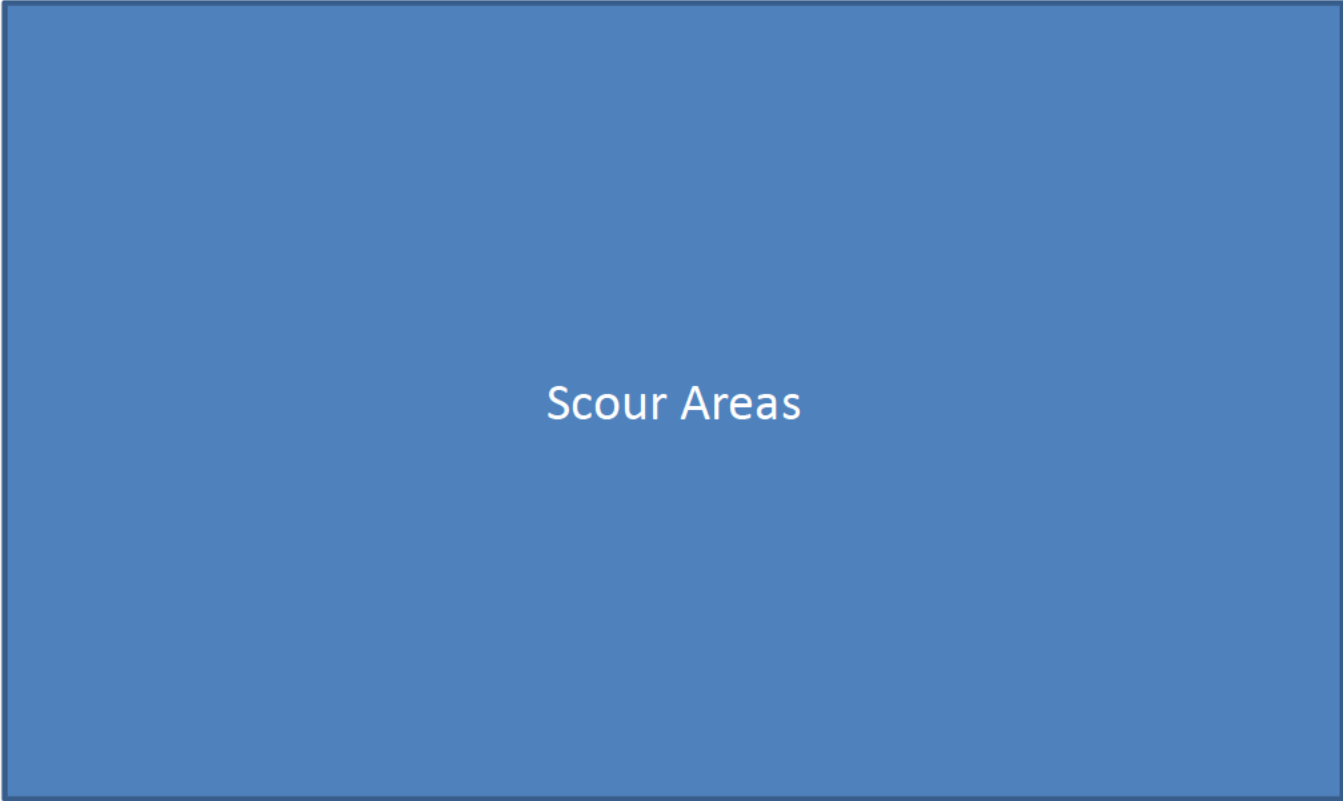
# Station B414: Nearshore Location



# Soft Sediment Accepted Sample

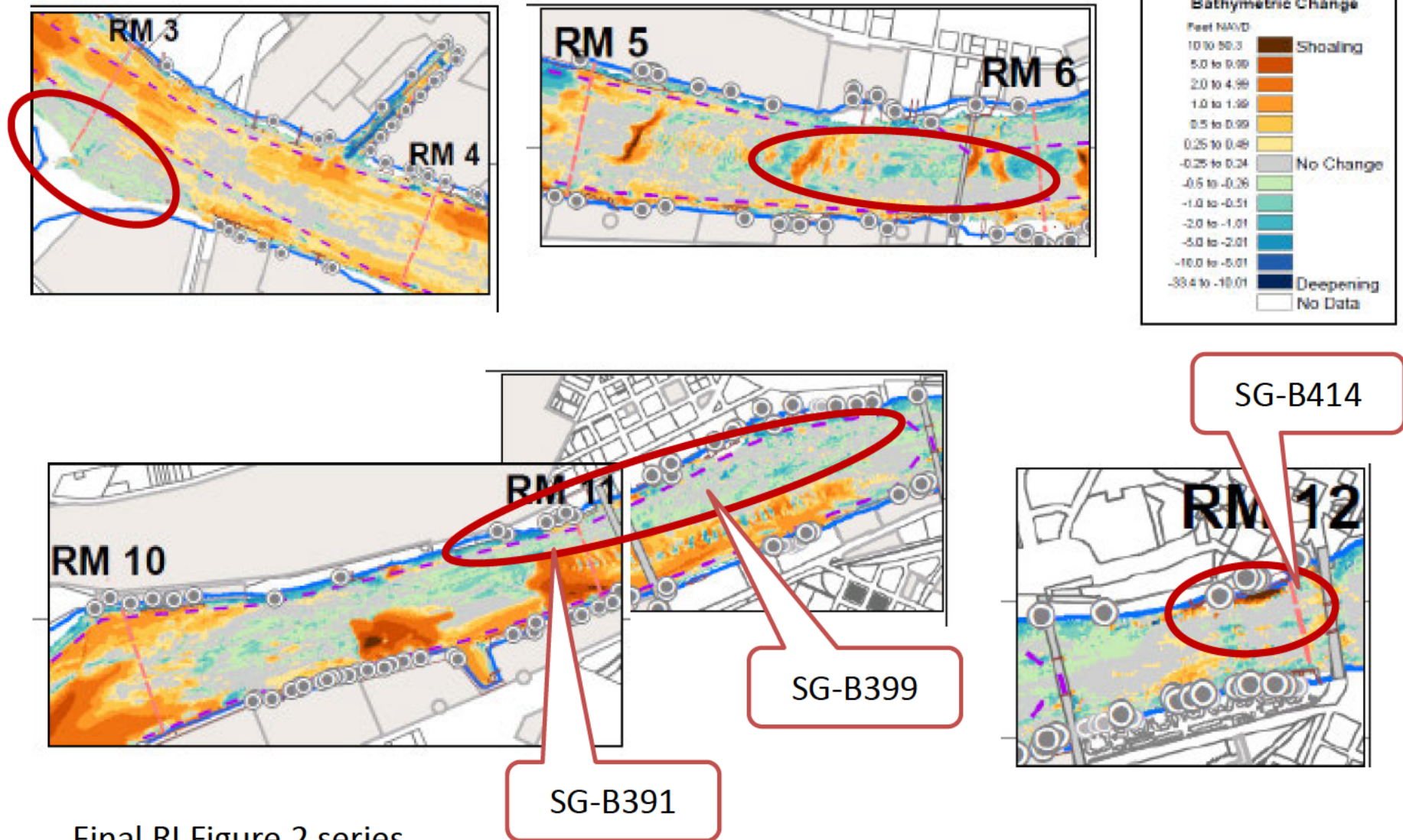
*3 attempts at primary station (23, 23, and 20 cm depth)*





Scour Areas

# Bathymetry Changes – areas of scour



Final RI Figure 2 series

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# Bathymetry Changes – areas of scour

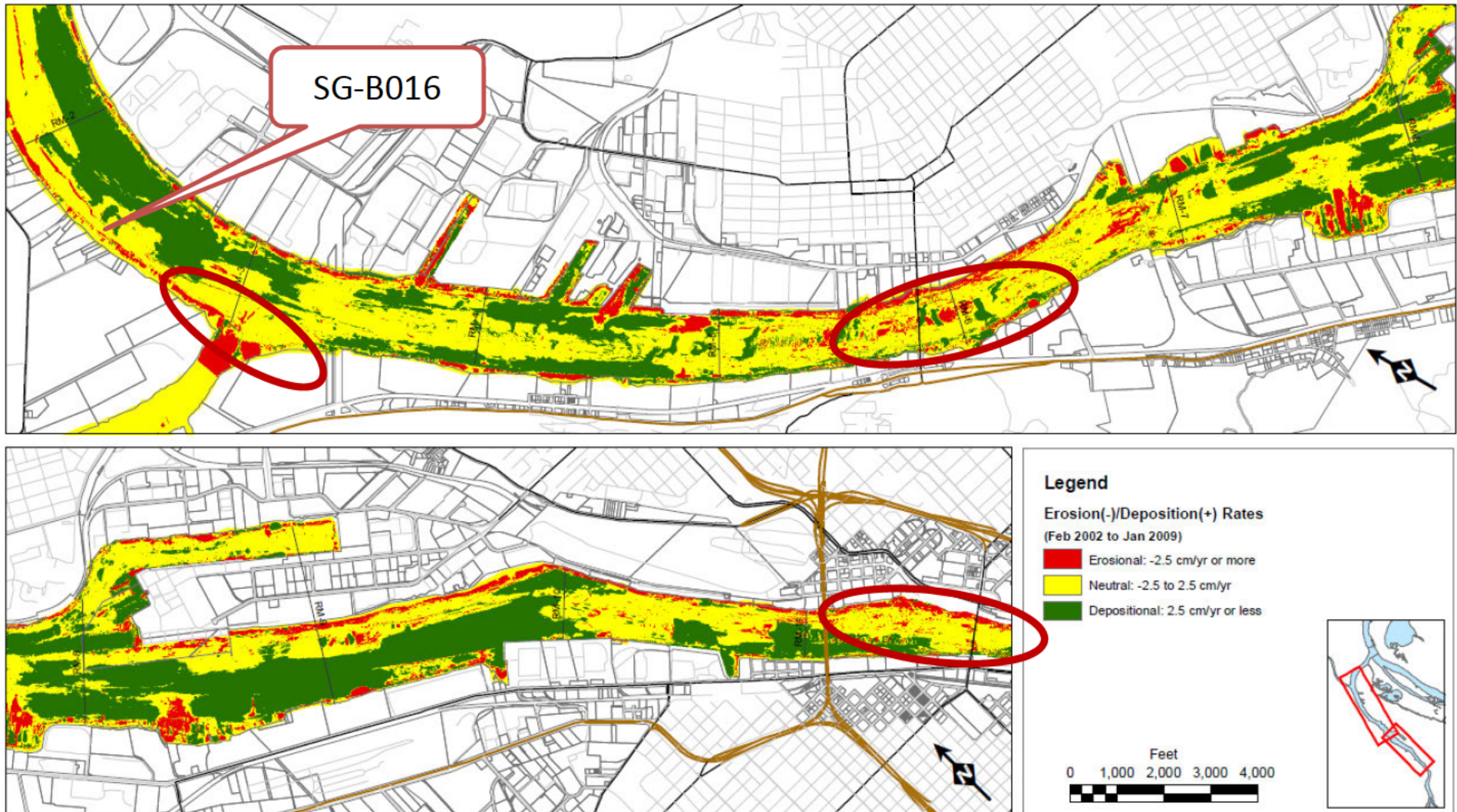


Figure 3.4-20 Sediment Deposition Rates

Bottom Shear Stress is high b/w RM 11 to 12  
*correlates with sand & gravel in grabs, avg ~15 cm*

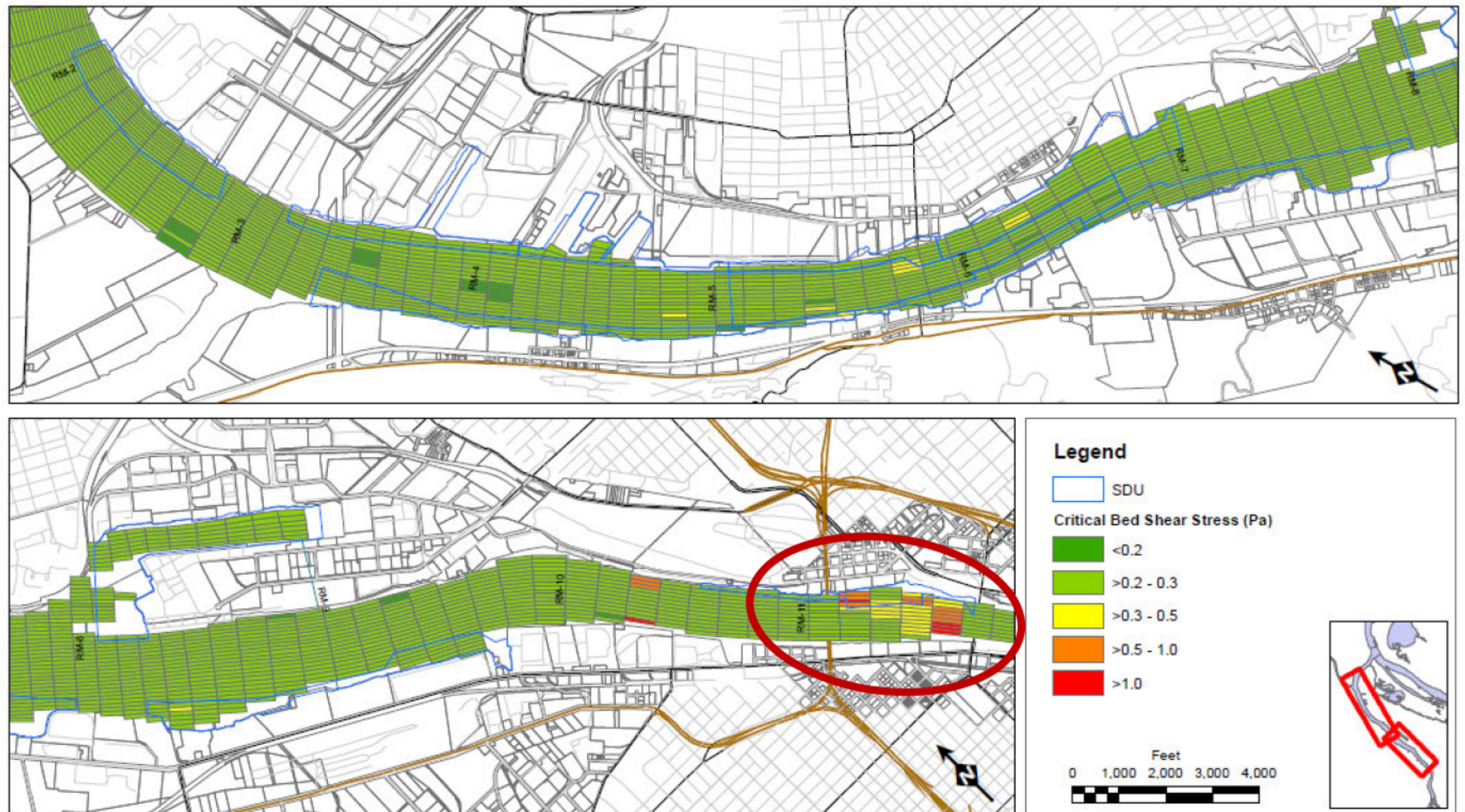


Figure 3.4-18b. Critical Bed Shear Stress (Pa)

# Locations w/ 10 to 20 cm Avg Recovery Depth

Sample ID	River Mile	Date Sample Collected	Sample Depth				Location			# of Attempts	Substrate
			Substation Collection Depth (cm)			Avg Sample Recovery Depth (cm)	Primary (w/in 25'/50' Radius)	Alt 1	Alt 2		
SG-B001	1.9-3	3/30/2018	10	14	11	12	Y			9	rocks/ riprap
SG-B016	2-3	4/1/2018	15	15	15	15	Y			4	sand/gravel
SG-B027	2-3	4/1/2018	14	11	12	12	Y			5	stiff silt
B040	2-3	4/3/2018	16	18	20	18	Y			9	wood
B048	2-3	4/4/2018	14	10	13	12	Y			12	sand/gravel
B050	3-4	4/4/2018	16	15	16	16	Y			4	sand/gravel
B055	3-4	4/4/2018	8	13	11	11	Y			7	gravel
B052	3-4	4/5/2018	18	15	13	15	Y			9	wood
B053	3-4	4/5/2018	12	19	20	17	Y			5	wood
B062	3-4	4/6/2018	19	17	14	17	Y			10	sand
B066	3-4	4/8/2018	20	18	19	19	Y			7	stiff silt
B084	3-4	4/9/2018	17	19	16	17	Y			5	sand
B079	3-4	4/9/2018	21	21	16	19	Y			5	
B103	4-4.5	4/10/2018	11	20	17	16	Y			9	gravel/rocks

Excerpts from FSP

# Excerpts of Approved Surface Sediment Field Sampling Plan

## Section 1.2 Project Overview, p. 2

Surface sediment will be collected from a target depth of 0- to 30-centimeter depths, consistent with the RI (Intergral 2004). A minimum depth of 10 centimeters will be considered acceptable (especially if sampling on a sediment cap). Additionally, surface sediment samples will be collected from the D/U Reach. The D/U Reach stations will be located in sediment areas targeting fine-grained sediment and higher total organic carbon (TOC), generally similar to surface sediment within the Site; target ranges are discussed in Section 2.1.4. The sampling scheme and RAOs are also discussed in the PDI Work Plan (Geosyntec 2017).

## Section 4.3 Sample Collection and Processing, p. 11

The hydraulic power grab samplers (similar to a van Veen grab sampler but with power-assist) will target collection of sediment from the upper 0 to 30 centimeters of sediment at three sampling points at each sample location (without adjusting vessel position); the three grab samples will be composited into a single sample for analysis. The three-point composite sample will be collected within a relatively small footprint around the sampling vessel (i.e., less than 25 feet). For example, grab #1 will be deployed, accepted, and processed on the deck of the vessel.

# Excerpts of Approved Surface Sediment Field Sampling Plan

In general, the volume of sediment from the three-point surface grabs will be homogenized until uniform in color and texture. Color and texture will be described following the ASTM visual-soil classification method (Appendix A-1). Sediments will be collected from the hydraulic power grab using a stainless-steel spoon, avoiding sediments in contact with the sides of the power grab. Large organisms and pieces of debris will be removed and noted in the sample log sheet (Appendix A-3). Acceptance criteria include the following (PSEP 1996; Integral 2004):

1. No or minimal excess water leaking from the jaws of the sampler.
2. No excessive turbidity in the overlaying water of the sampler.
3. Sampler did not over-penetrate.
4. Sediment surface appears to be intact with minimal disturbance.
5. Program-specific penetration (target 30 centimeters) has been achieved (minimum of 20 centimeter).

After sample acceptance, the sediment will be placed in a large, stainless-steel bowl for homogenization. Once the volume of sediment from each grab has been homogenized to a uniform consistency and color, composited sediments will be visually described following

### 4.4 Contingency Plan for Field Condition Impediments to Collecting Samples

During the sediment grab sampling efforts, the field crew may encounter field conditions that preclude collection of grab samples at the planned stations (e.g., limited access, poor recovery, safety concerns, debris/rock/bedrock causing refusal). A total of three attempts will be made to relocate the sample to an area within a 25-foot radius of the planned station.<sup>1</sup> If an acceptable sample cannot be obtained within 25 feet, sample collection from within a 25-foot to 50-foot radius will be attempted.

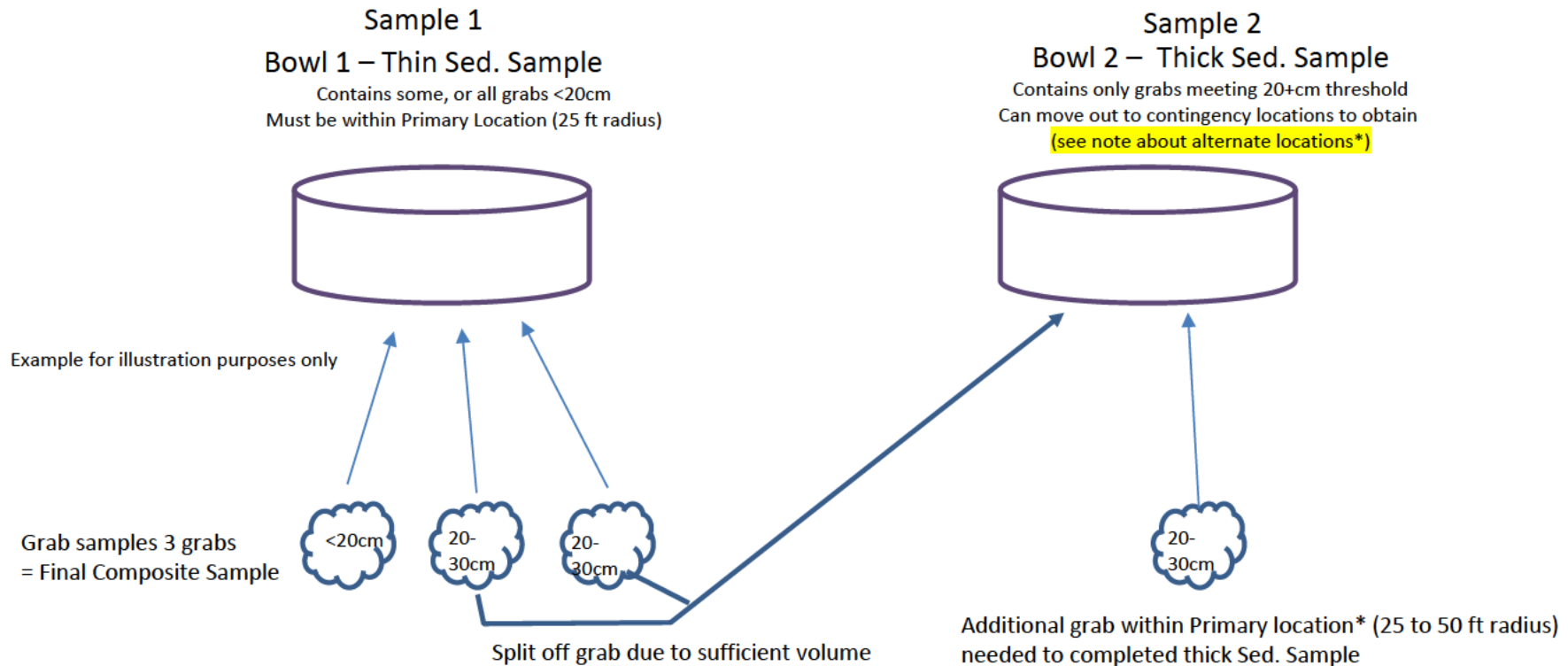
For stratified random sample locations, if a sediment grab sample cannot be collected from within 50 feet of the target location due to inaccessibility or three failed grab attempts, the re-randomized Alternate Location 1 (Figure 6) will be attempted. If the Alternate Location 1 is inaccessible or three failed grab attempts occur, the re-randomized Alternate Location 2 (Figure 7) will be attempted. The field staff will notify the PDI Project Manager as soon as it is determined that a primary location and both alternatives cannot be sampled due to inaccessibility, and the EPA will be notified immediately by the PDI Project Coordinator. If three attempts at Alternative 2 locations fail to produce acceptable grab samples, then the three best sample attempts at this location will be retained for sample processing. The sampling depth will be recorded in the field notebooks. Sample location coordinates for Alternate 1 and Alternate 2 are provided in Tables 3 and 4, respectively. Alternate sampling locations were re-randomized using a GIS randomization program to maintain the geostatistical methods used during development of the PDI Work Plan (Geosyntec 2017). The rationale for moving to Alternate Location 1 or, if needed, Alternate Location 2, will be documented in the field log.

For SMA target locations, the radius protocol described above will be used. The re-randomization geostatistical methods are not necessary as a contingency plan for the SMA locations as these locations were not randomly generated. In the event that field conditions preclude the field crews from collecting proposed target samples within SMAs, attempts from within a 25-foot to 50-foot radius will be continued until an acceptable grab is obtained.

# EPA “Two Bowl Flow Chart” Received 4/23/18

## Surface Sediment Sampling Approach for Hard Sediment Conditions<sup>1</sup> (when penetration threshold is not being met)

1 – Does not apply to debris, rock, or structure encounters



**\*If alternative location is necessary – then the whole sample set and methodology above needs to be repeated if hard sediment is encountered**

- bottom conditions
- FSP language
- Protocol